

### TYPICAL PHYSICAL PROPERTIES

PROPERTY	ASTM TEST	UNIT	LGWS	DGWS
Density	Archimedes's principle method	g/cm <sup>3</sup>	2.66	2.79
Porosity (25 to 600 deg C)	Open	%	4.82	2.79
Water Absorbtion	SANS497:2011 standard	%	1.79	0.93
Specific Gravity	Mintek	-	2.76-2.85	
Softening Temperature (@ normal pressure)	-	°C	1600	
Linear Coefficient of: Thermal Expansion	-	Per°C		
25 deg C to 100 deg C	-		2.9 x 10 <sup>-6</sup>	
25 deg C to 600 deg C	-		3.6 x 10 <sup>-6</sup>	
Specific heat capacity	-	J/kg.deg C		
Pyrophyllite – 25 ° C	-	25 deg C	1220	
Pyrophyllite – 500 ° C	-	500 deg C	1306	
Energy Density	-	kJ/m <sup>3</sup> .deg C		
Pyrophyllite – 25 ° C	-	25 deg C	3420	
Pyrophyllite – 500 ° C	-	500 deg C	3655	
Colour(Air fired)	-	-	Pinkish	
Safe operating temperature (Continous heat @ normal pressure)	-	deg C	1100	
Thermal Conductivity (Approx values)	-	[ W/mK ]		
Unfired			1,5	
Fired to 900 deg C			1.67	
Fired to 1200 deg C			2,5	

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Updated on 05/04/2018

## TYPICAL MECHANICAL PROPERTIES

PROPERTY	ASTM TEST	UNIT	LGWS	DGWS
Hardness	Rockwell Hardness test HR15T.	Rockwell	40.020	60.96
		Rockwell HV	41.400	62.20
		Rockwell HRF	30.080	55.96
Hardness after firing <i>to 1300 deg C</i>	-	Moh's Scale	6.000	6.00
Flexural Strength	Cermalab	Mpa	25.000	38.20
<i>isostatically pressed,fired to 800 deg C</i>		Mpa	8.400	10.30
<i>isostatically pressed,fired to 1300 ° C</i>		Mpa	14.300	28.10
Uniaxial Compressive Strength (UCS)	UCS	Mpa	93.700	114.90
<i>isostatically pressed,fired to 800 deg C</i>			82.000	84.80
<i>isostatically pressed,fired to 1300 ° C</i>			86.600	141.60
Young Modulus (E)	UCM	Gpa	20.300	42.02
Poisson's Ratio ( $\nu$ )	UCM	$\nu$	0.160	0.32
Strengthening parameter ( $\beta$ )			3.640	3.79
Cohesion (Co) MPa		Mpa	17.400	26.80
Friction angle ( $\phi$ )			34.700	35.60
Tensile Strength	Cermalab	Mpa	1.300	1.40
<i>isostatically pressed,fired to 800 deg C</i>			1.300	1.40
<i>isostatically pressed,fired to 1300 ° C</i>			1.200	1.40
Resistance to Impact (6.35 mm rod or 1/4 ")	D667-42T	inch- lbs	3.30	
Thermal shock resistance <i>isostatically pressed,fired to 1000 deg C</i>	Cermalab	-	Excellent	Excellent

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## TYPICAL ELECTRICAL PROPERTIES

PROPERTY	ASTM TEST NUMBER	UNITS	WONDERSTONE
Dielectric strength <i>(Step 60 cycles)</i>	D667-42T	Volts per mil	100.000
Dielectric Constant (Relative Permittivity) <i>60 cycles</i> <i>1 MHz</i> <i>10 MC</i> <i>100 MC</i>	D667-42T		- 5.300 5.300 5.200
Power Factor <i>60 cycles</i> <i>1 MC</i> <i>10 MC</i> <i>100 MC</i>	D667-42T		- 0.010 0.009 0.007
Loss factor <i>60 cycles</i> <i>1 MC</i> <i>10 MC</i> <i>100 MC</i>	D667-42T		- 0.053 0.048 0.036
Te Value		°C	0.700
Volume Bulk Resistivity at temperatures <i>25 deg C</i> <i>100 deg C</i> <i>300 deg C</i> <i>500 deg C</i> <i>700 deg C</i> <i>900 deg C</i>		Ohms per centimeter cube	$> 1.0 \times 10^{14}$ $6.0 \times 10^{11}$ $2.0 \times 10^9$ $5.0 \times 10^6$ $3.5 \times 10^5$ $5.0 \times 10^4$

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## TYPICAL CHEMICAL ANALYSIS

COMPOUND	DGWS (WT%)	LGWS (WT%)
SiO <sub>2</sub>	57.433	58.900
Al <sub>2</sub> O <sub>3</sub>	31.433	31.367
Fe <sub>2</sub> O <sub>3</sub>	0.970	1.300
TiO <sub>2</sub>	1.850	1.917
CaO	0.045	0.029
MgO	0.237	0.063
Na <sub>2</sub> O	0.207	0.193
K <sub>2</sub> O	0.627	0.707
MnO	0.006	0.001
P	0.073	0.055
Ba	0.012	0.013
Cr	0.047	0.021
Cu	0.001	0.001
Ni	0.001	0.001
Sr	0.007	0.008
V	0.029	0.032
Zn	0.001	0.001
LOI	6.700	6.133
C	0.797	0.243
S	0.011	0.013
TOTAL	100.487	100.999

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